

17. An apparatus for processing a process region of a substrate, using a plasma, comprising:

a container substantially formed of a conductive material;

a partition plate supported by said container and defining an air-tight process container portion and an air-tight auxiliary container portion, and having a window plate made of dielectric;

a main exhaust pump for exhausting and setting said process container portion to a vacuum;

a work table arranged in said process container portion and having a support face facing said window plate, the substrate being mountable on said support face with the process region facing said window plate;

a main supply for supplying a process gas between said window plate and the substrate mounted on said support face, at least part of the process gas being transformable into the plasma;

an antenna for generating an electromagnetic field between said window plate and the substrate mounted on said support face to induce generation of the plasma, arranged in said auxiliary container portion and facing said window plate;

a power supply section for applying a high frequency voltage to said antenna;

an auxiliary exhaust pump for exhausting and setting said auxiliary container portion to a vacuum; and

a pressure controller connected to said auxiliary exhaust pump for keeping a pressure difference between pressures in said process and auxiliary container portions at a minimum value.